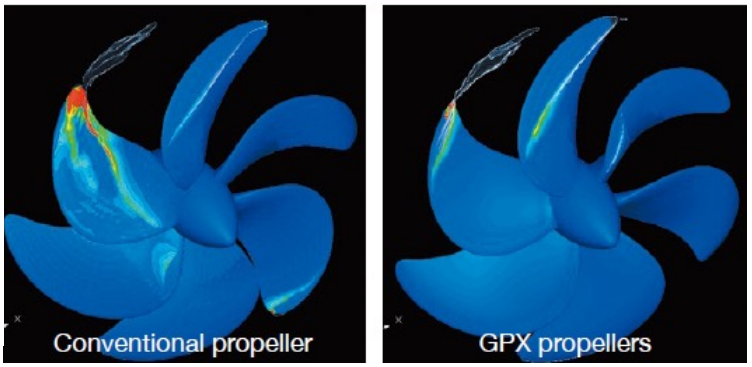
GPX Propeller

SMALLEST BLADE AREA PROPELLER

Design technology with CFD

Highly accurate cavitation prediction is essential for the design of propellers with minimized blade areas, aimed at reducing fuel consumption and maximizing energy savings. Our large-scale CFD system, equipped with 8,000 cores, enables us to conduct various cavitation simulations, leading to high-performance designs in a short timeframe. Furthermore, while many companies invests significant amount of time and money on model tests during development, we leverage our large-scale CFD system to verify energy saving effects at the scale of the actual ship, ensuring delivery of optimal designs.

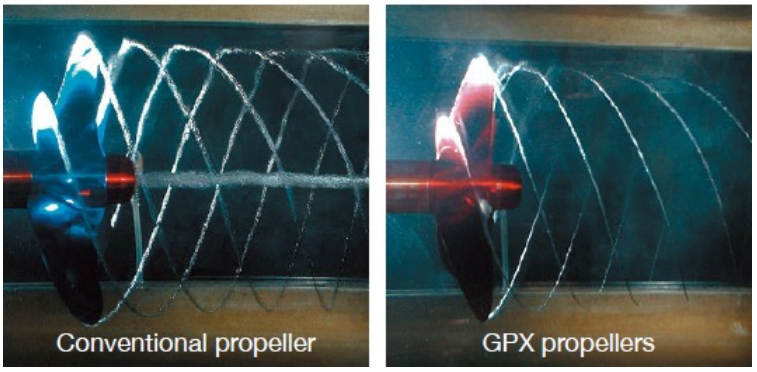
Example of cavitation analysis via CFD



Integration of smallest blade area and NHV technology

The GPX propeller, born from a joint research with the Ministry of Land, Infrastructure, and Transport as part of the latter's greenhouse gas (GHG) reduction project, integrates minimized blade area with NHV (non- hub-vortex) technology further improves the performance by reducing frictional resistance through minimizing the blade area and utilizing the hub vortex recovery effect of NHV technology, which separates our GPX propellers apart from conventional ones.

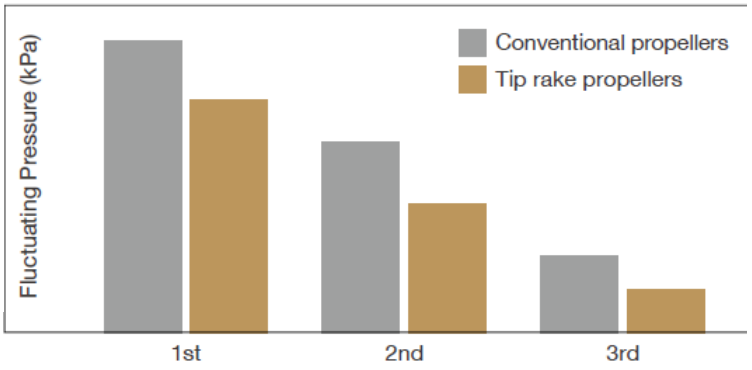
Propeller hub vortex cavitation comparison



Tip rake for cavitation reduction

Generally, a reduction in the propeller blade area increases cavitation. However, the GPX propeller, with its tip rake design, overturns this conventional wisdom. The tip rake, which is the angle formed by the locally curved tip of the blade, suppresses cavitation, reducing erosion risk and pressure fluctuations. Our tip rake technology simultaneously achieves the generally contradictory phenomena of a small blade area and improved cavitation performance.

Measured pressure fluctuations from model tests



NAKASHIMA

We Go Beyond